

FIG.1

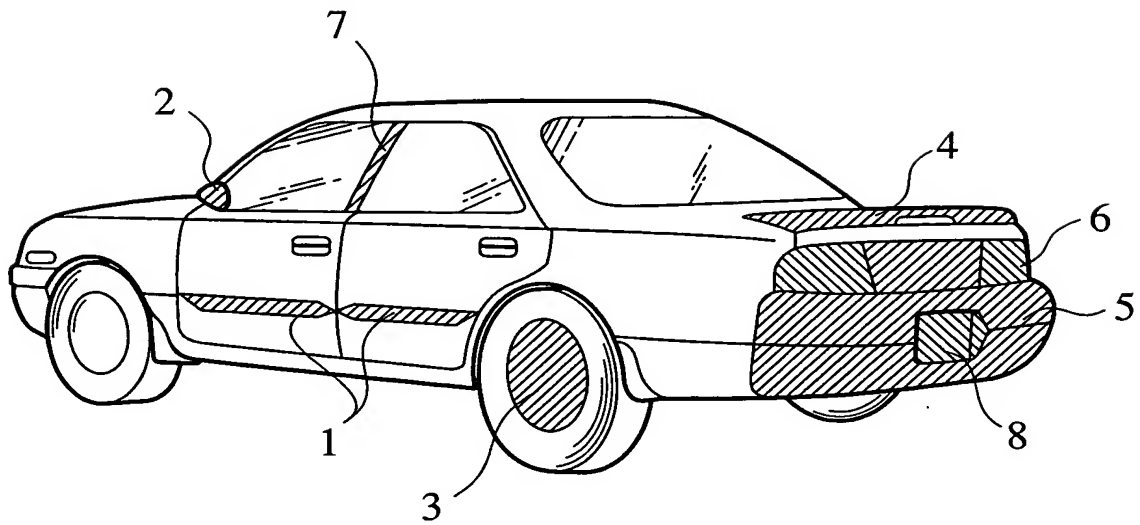


FIG.2A

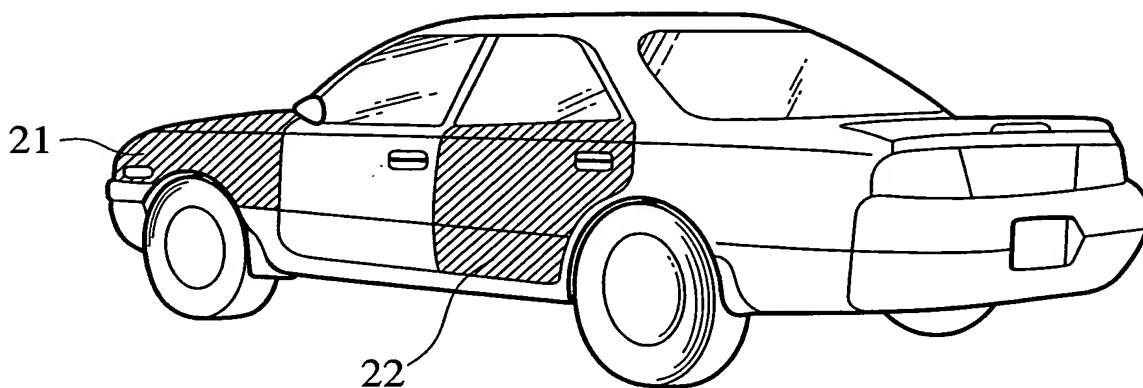


FIG.2B

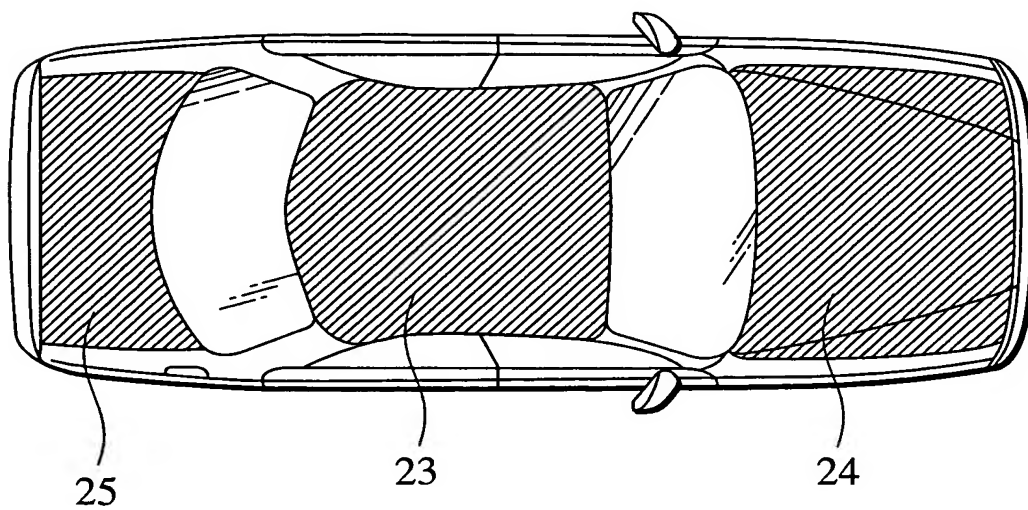


FIG.3

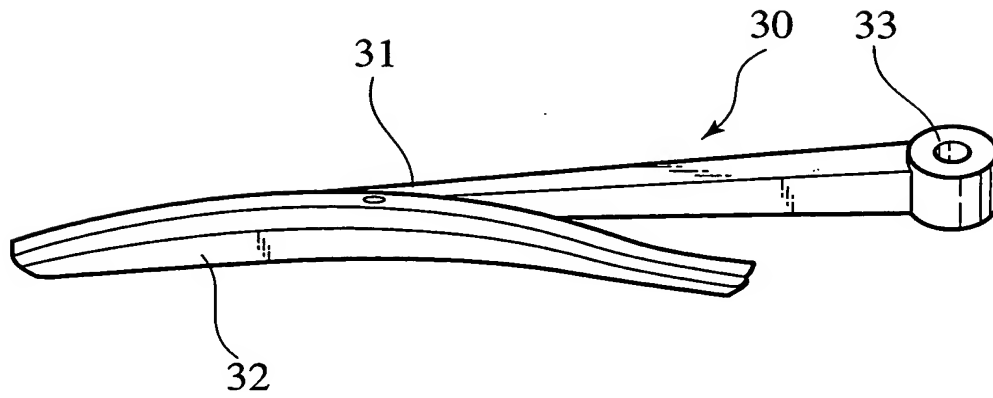


FIG.4

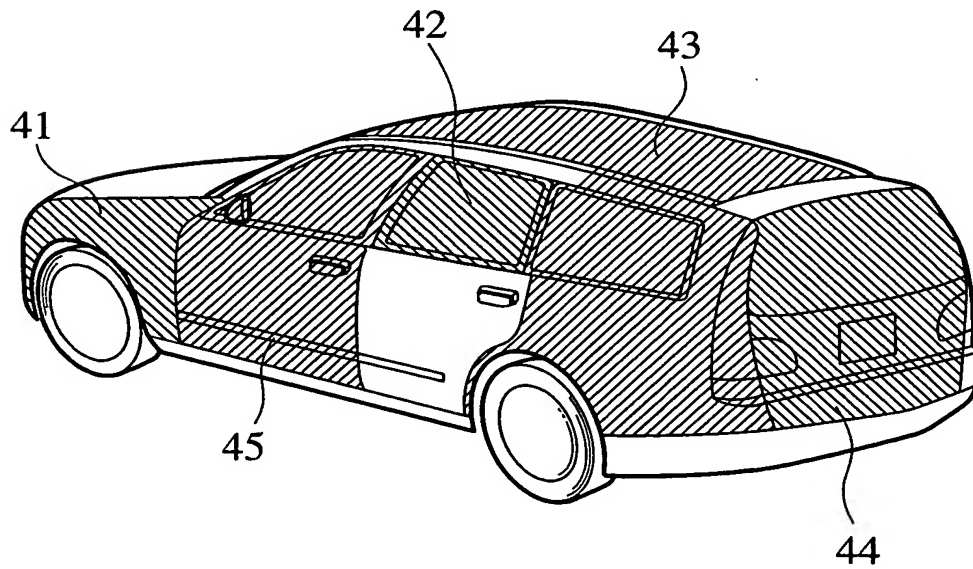


FIG.5

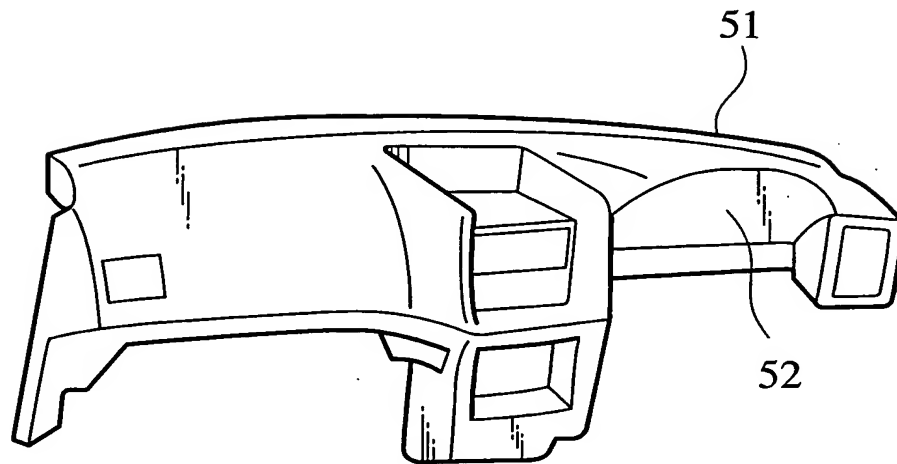


FIG.6

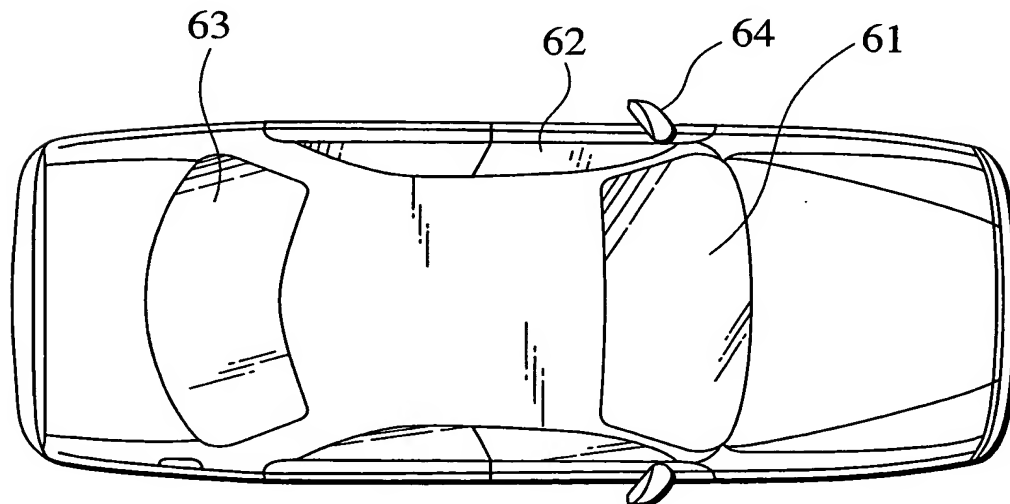


FIG.7

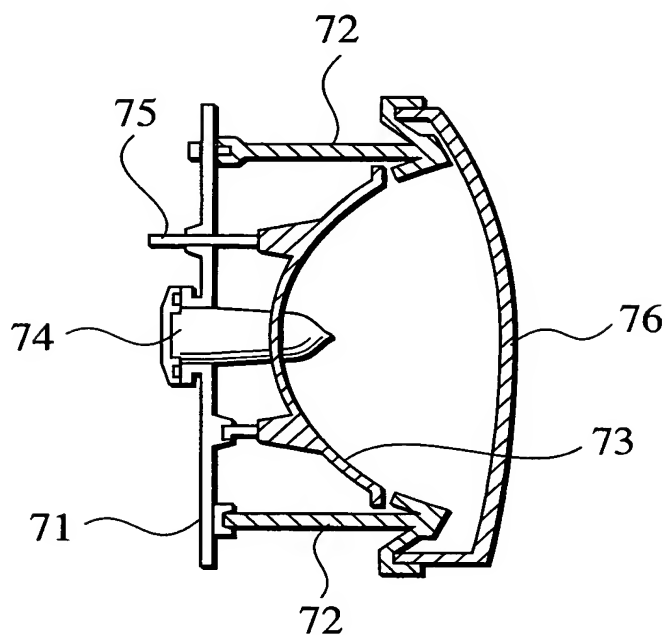


FIG.8

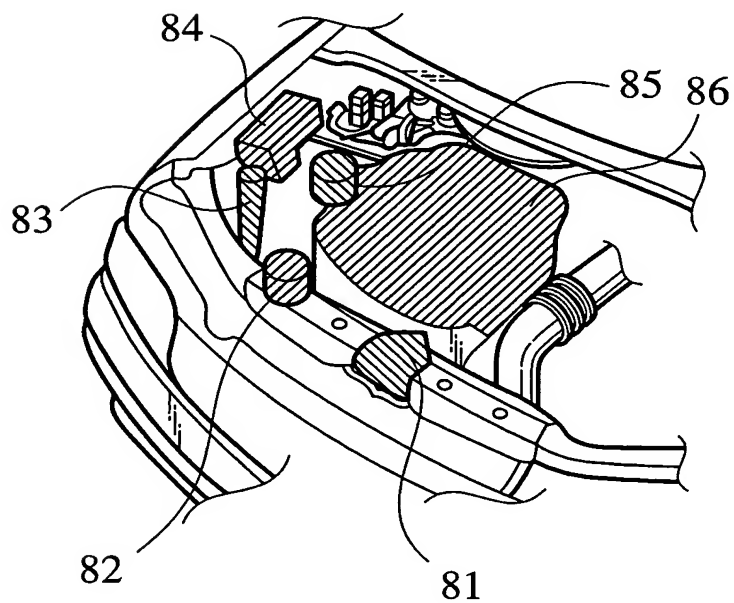


FIG.9

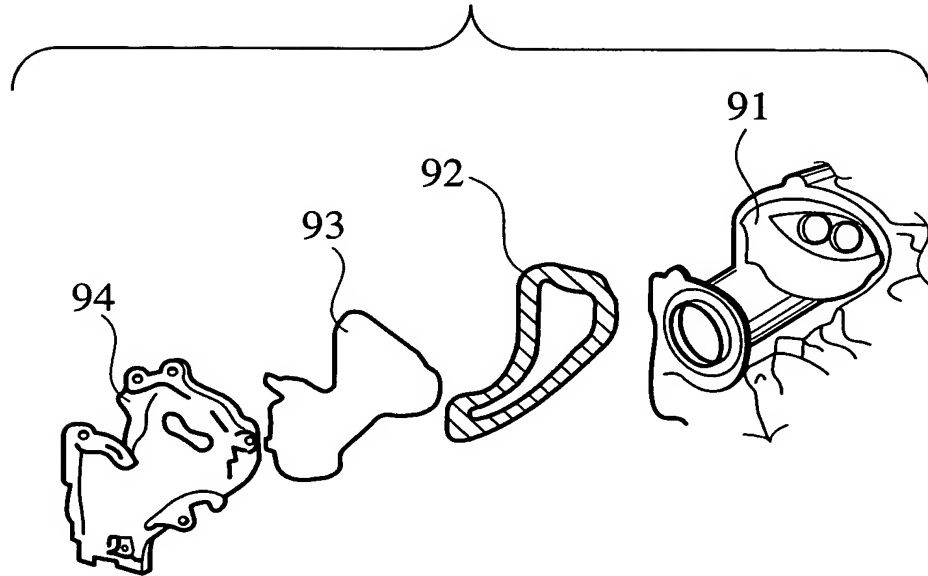


FIG.10

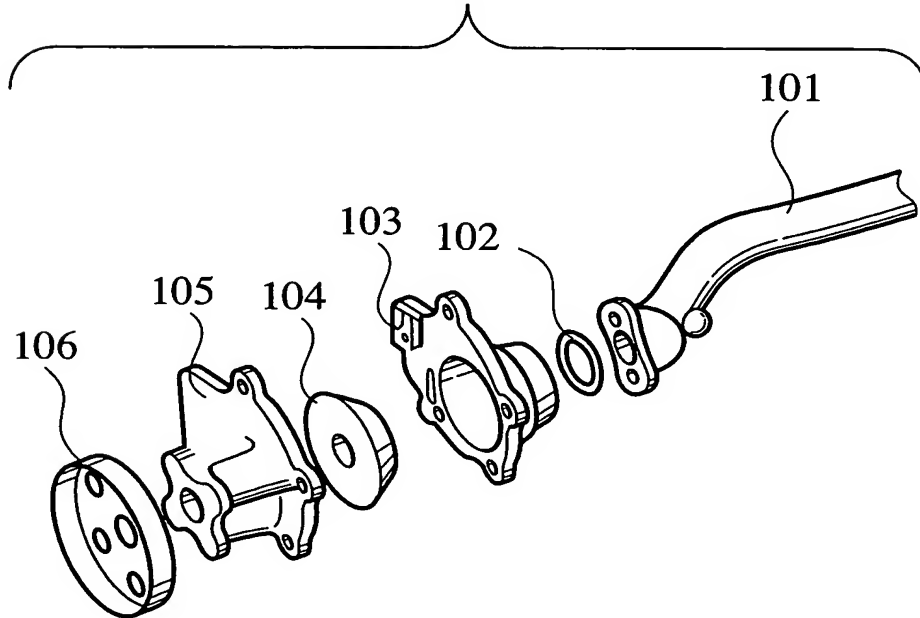
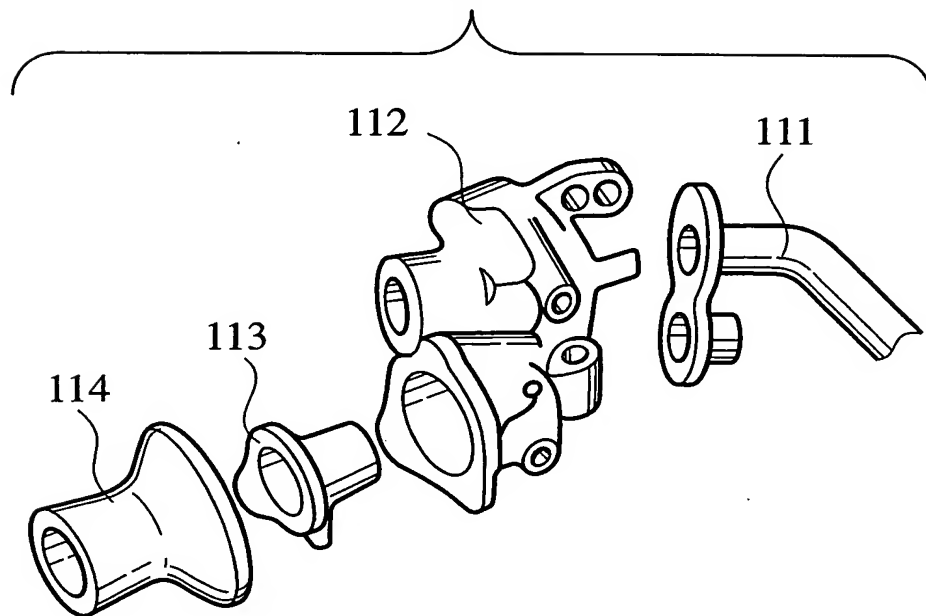


FIG.11



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FIG.12A

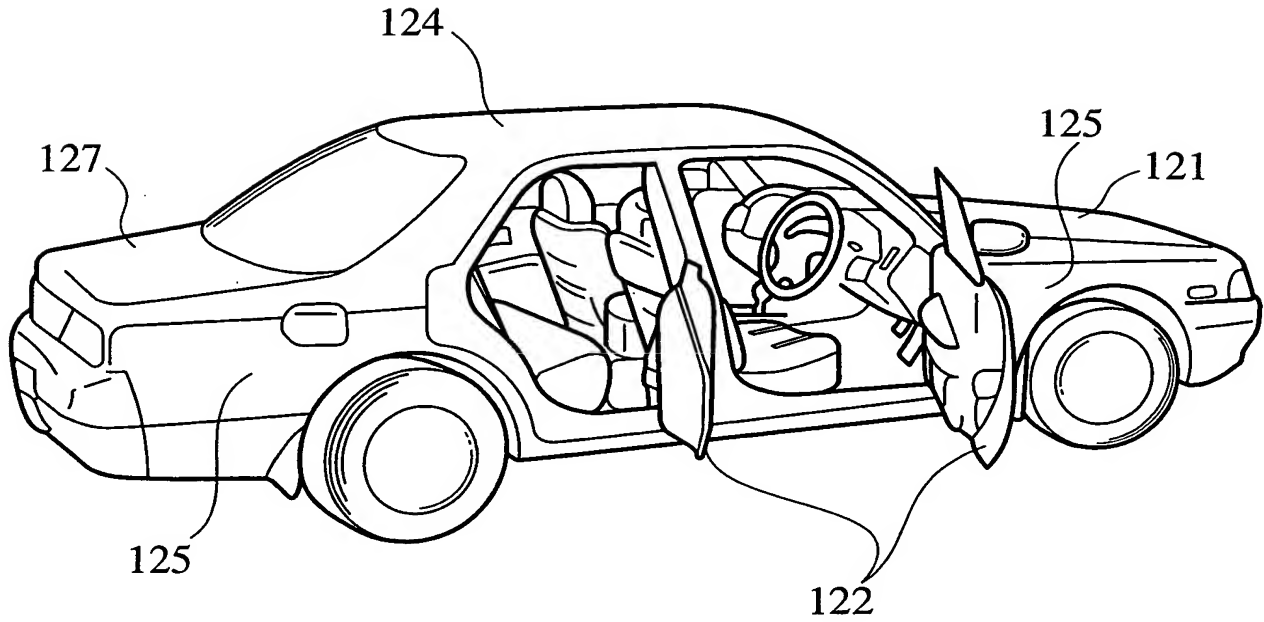
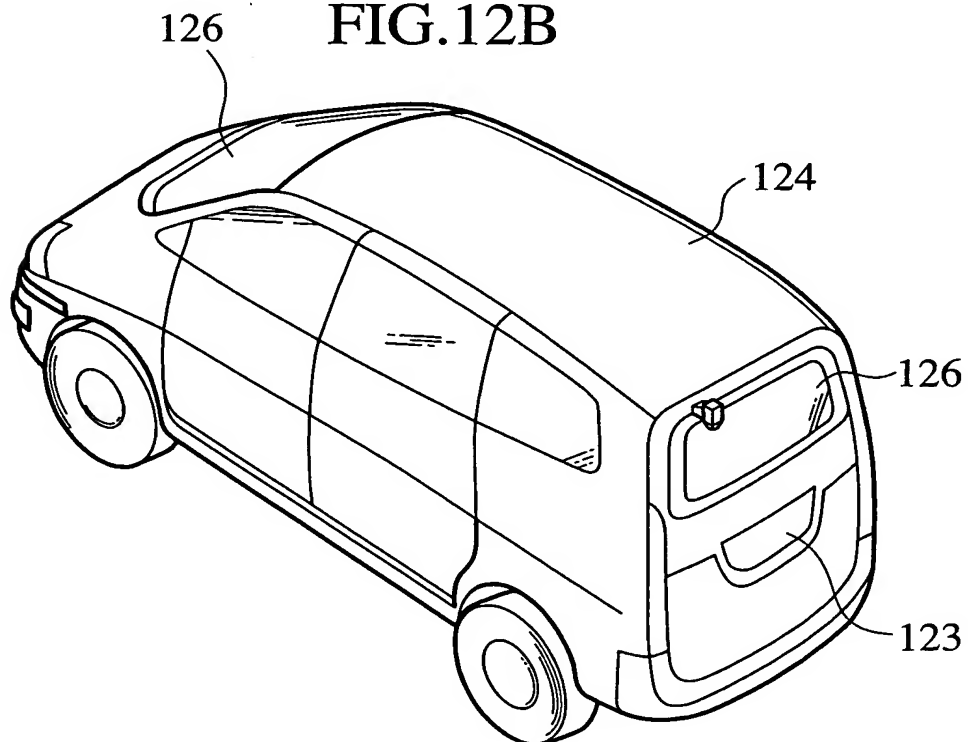


FIG.12B



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FIG.13A

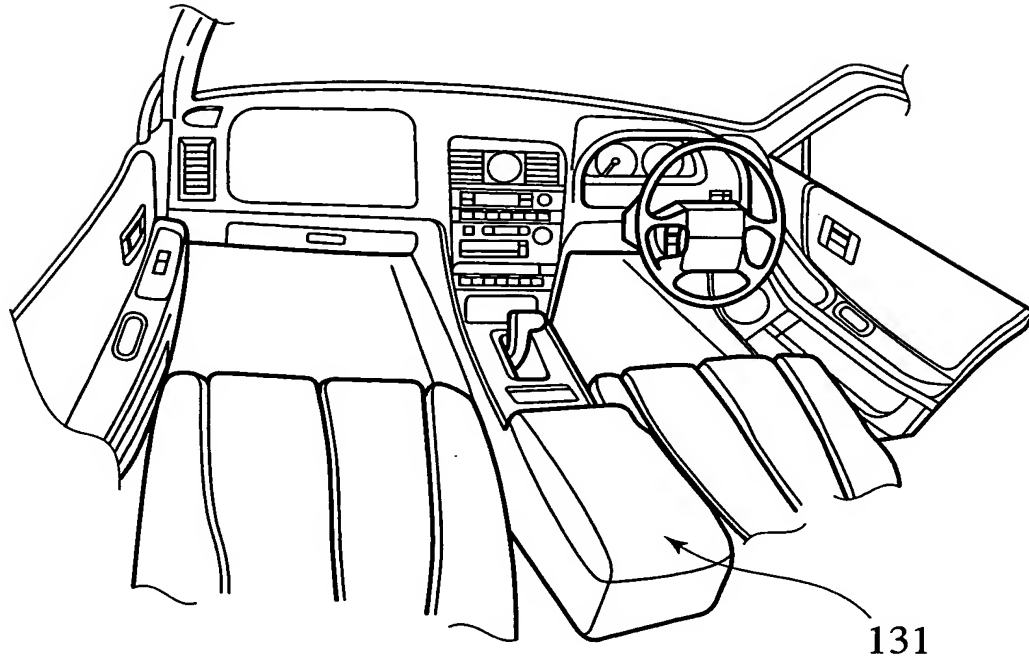
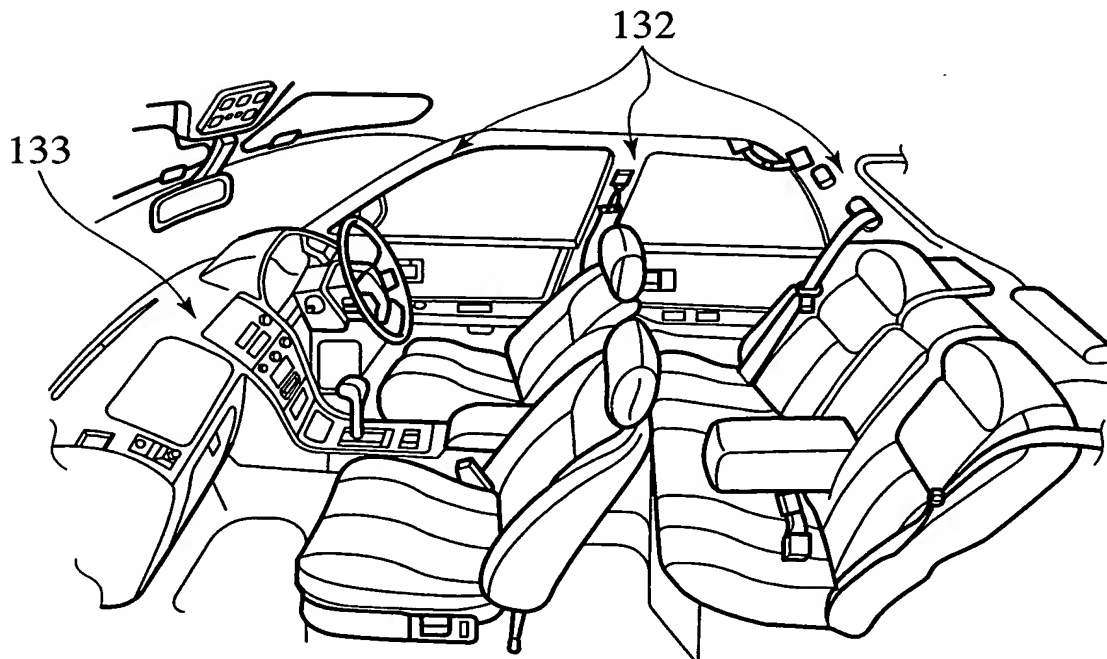


FIG.13B



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FIG.14

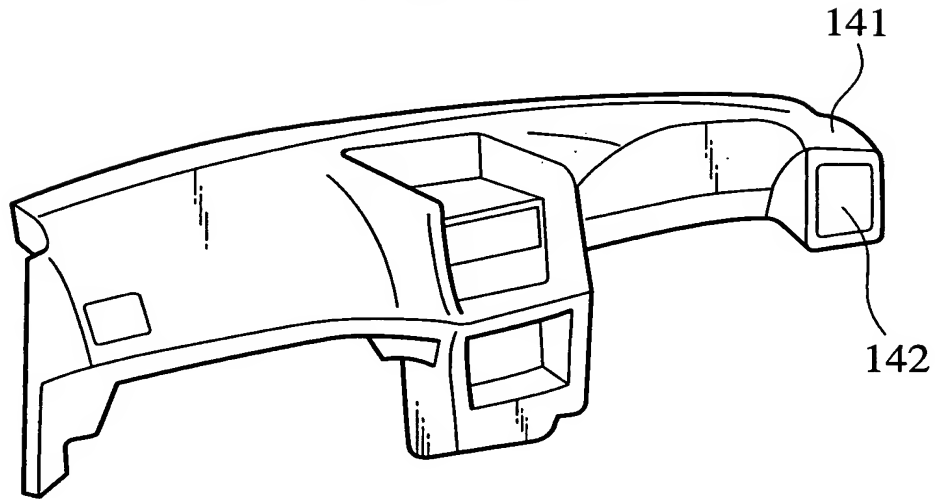


FIG.15

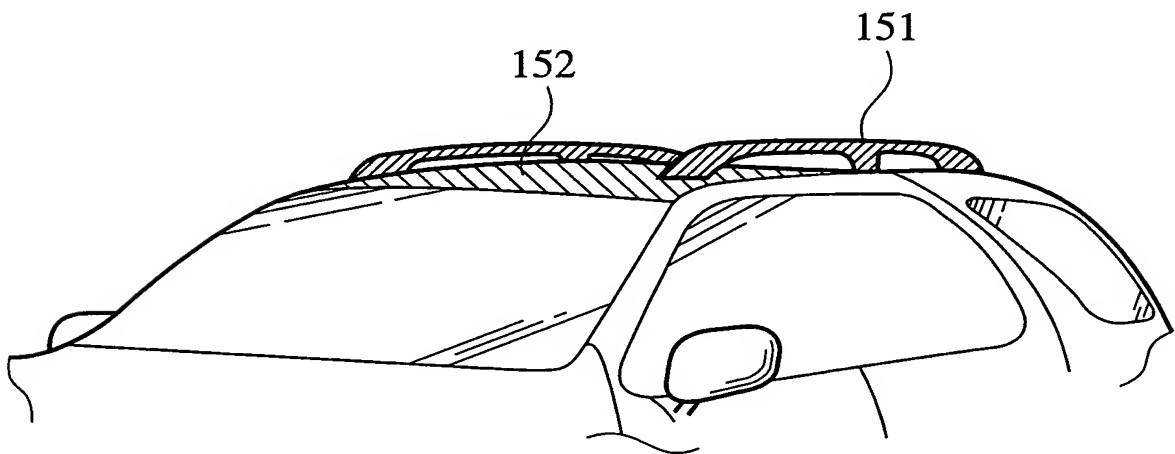


FIG.16

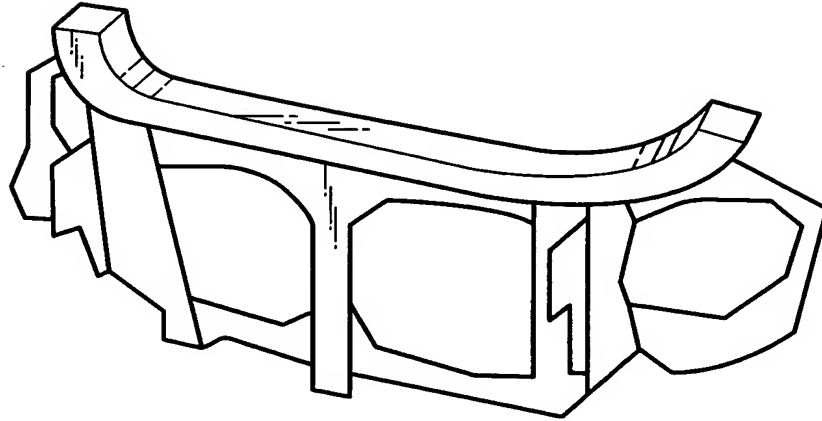


FIG.17A

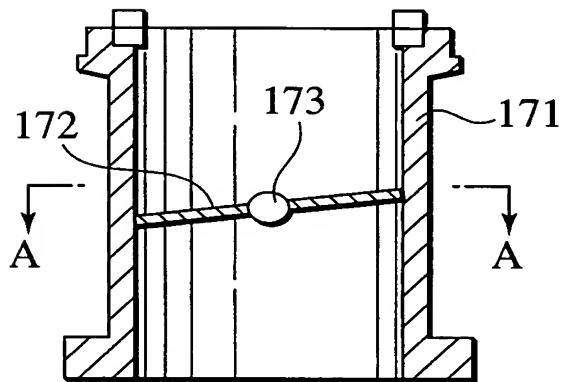
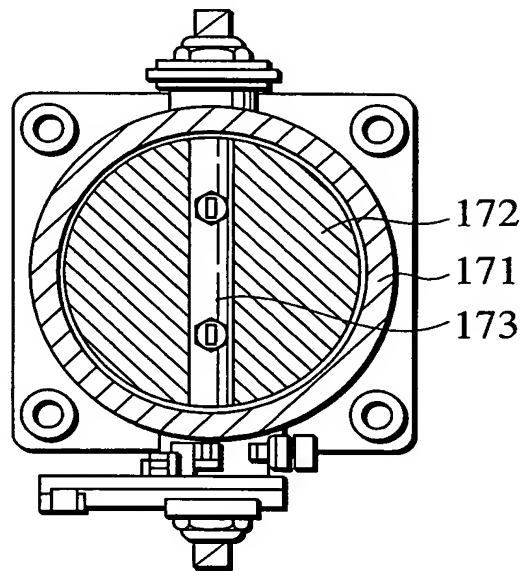


FIG.17B



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FIG.18

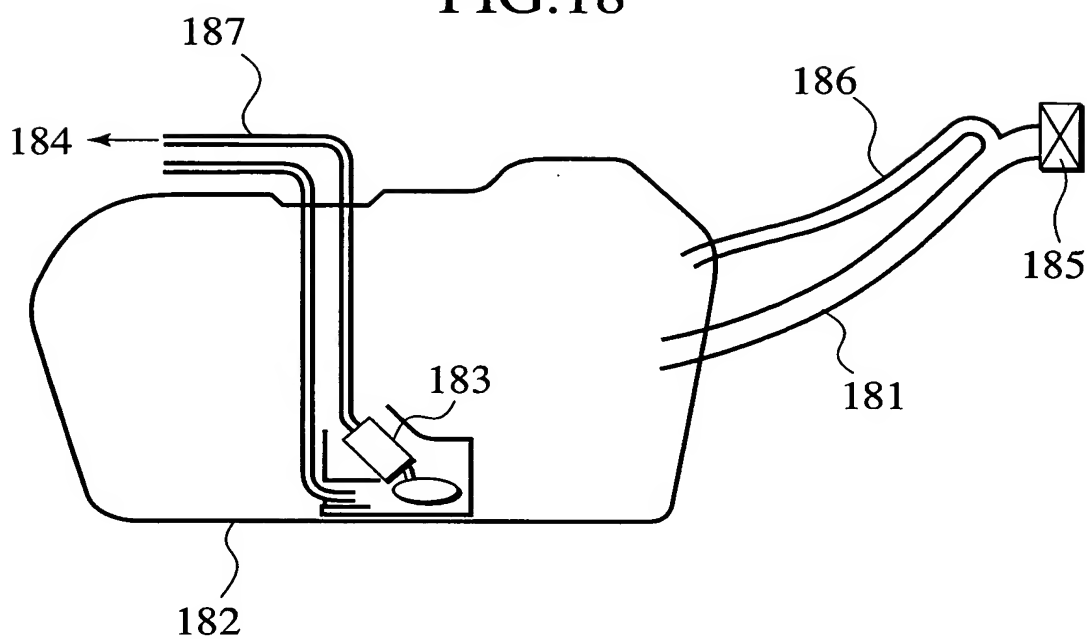


FIG.19

	Ex.1-i	Ex.1-ii	Ex.1-iii	Ex.1-iv	Ex.1-v	Ex.1-vi	COM.Ex.1	COM.Ex.2
MONOMER	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID
PARTICLE SIZE OF SILICA(nm)	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
FUNCTIONAL GROUP ON SILICA	ALKYL GROUP AMINO GROUP	ALKYL GROUP ETHER GROUP	ALKYL GROUP ESTER GROUP	ALKYL GROUP NITRO GROUP	ALKYL GROUP CYANO GROUP	ALKYL GROUP EPOXY GROUP	ALKYL GROUP	AMINO GROUP
POLAR GROUP(%)	45	40	40	40	40	40	0	40
HYDROPHOBIC GROUP(%)	50	50	50	50	50	50	50	0
HYDROXYL GROUP(%)	5	10	10	10	10	10	50	60
CONTENTS OF SILICA(%)	30	30	30	30	30	30	30	30
TOTAL LIGHT TRANSMITTANCE(%)	91	92	93	93	90	91	90	84
DISPERSED STATE	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	GOOD	GOOD	GOOD	
BENDING STRENGTH(MPa)	135	122	120	120	122	130	110	115
ELASTIC MODULUS IN BENDING(GPa)	4.6	4.4	4.4	4.2	4.3	4.5	3.8	4
COEFFICIENT OF LINEAR EXPANSION(1/°C)	4.5×10 ⁻⁵	4.5×10 ⁻⁵	4.6×10 ⁻⁵	4.4×10 ⁻⁵	4.5×10 ⁻⁵	4.4×10 ⁻⁵	4.8×10 ⁻⁵	5.0×10 ⁻⁵

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FIG.20

	Ex.2- i	Ex.2-ii	Ex.2-iii	Ex.2-iv	Ex.2- v	Ex.2-vi	COM. Ex.1	COM. Ex.2
MONOMER	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID	METHYL METHACRYLATE ACRYLIC ACID
PARTICLE SIZE OF SILICA(nm)	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
FUNCTIONAL GROUP ON SILICA	ALKYL GROUP AMINO GROUP	ALKYL GROUP ETHER GROUP	ALKYL GROUP ESTER GROUP	ALKYL GROUP NITRO GROUP	ALKYL GROUP CYANO GROUP	ALKYL GROUP EPOXY GROUP	ALKYL GROUP	AMINO GROUP
POLAR GROUP(%)	40	40	40	40	40	40	0	40
HYDROPHOBIC GROUP(%)	50	50	50	50	50	50	50	0
HYDROXYL GROUP(%)	10	10	10	10	10	10	50	60
CONTENTS OF SILICA(%)	30	30	30	30	30	30	30	30
TOTAL LIGHT TRANSMITTANCE(%)	90	90	91	93	90	93	90	84
DISPERSED STATE	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	GOOD	EXCELLENT	GOOD	AGGREGATED
BENDING STRENGTH(MPa)	130	120	118	120	122	130	110	115
ELASTIC MODULUS IN BENDING(GPa)	4.5	4.4	4.2	4.2	4.4	4.5	3.8	4
COEFFICIENT OF LINEAR EXPANSION(1/ °C)	4.5×10^{-5}	4.5×10^{-5}	4.5×10^{-5}	4.6×10^{-5}	4.5×10^{-5}	4.4×10^{-5}	4.8×10^{-5}	5.0×10^{-5}

FIG.21

	Ex.3- i	Ex.3-ii	Ex.3-iii	Ex.3-iv	Ex.3- v	Ex.3-vi	COM.Ex.3- i	COM.Ex.3- ii
MONOMER	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE	POLY-CARBONATE
PARTICLE SIZE OF SILICA(nm)	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
FUNCTIONAL GROUP ON SILICA	ALKYL GROUP AMINO GROUP	ALKYL GROUP ETHER GROUP	ALKYL GROUP ESTER GROUP	ALKYL GROUP NITRO GROUP	ALKYL GROUP CYANO GROUP	ALKYL GROUP EPOXY GROUP	ALKYL GROUP	AMINO GROUP
POLAR GROUP(%)	40	40	40	40	40	40	0	50
HYDROPHOBIC GROUP(%)	50	50	50	50	50	50	50	0
HYDROXYL GROUP(%)	10	10	10	10	10	10	50	50
CONTENTS OF SILICA(%)	30	30	30	30	30	30	30	30
TOTAL LIGHT TRANSMITTANCE(%)	84	82	81	83	82	81	80	82
DISPERSED STATE	EXCELLENT	GOOD	GOOD	GOOD	GOOD	GOOD	AGGREGATED	
BENDING STRENGTH(MPa)	91	89	88	89	86	88	82	84
ELASTIC MODULUS IN BENDING(GPa)	2.6	2.5	2.6	2.7	2.6	2.6	2.4	2.5
COEFFICIENT OF LINEAR EXPANSION(1/°C)	4.8×10 ⁻⁵	5.0×10 ⁻⁵	5.2×10 ⁻⁵	4.8×10 ⁻⁵	5.0×10 ⁻⁵	5.1×10 ⁻⁵	5.4×10 ⁻⁵	5.5×10 ⁻⁵